September 28, 2001

Mr. J. M. Brown
Vice President - Operations
United States Enrichment Corporation
Two Democracy Center
6903 Rockledge Drive
Bethesda, MD 20817

SUBJECT: PORTSMOUTH INSPECTION REPORT 07007002/2001-007(DNMS)
AND NOTICE OF VIOLATION

Dear Mr. Brown:

On September 10, 2001, the NRC completed a routine resident inspection at the Portsmouth Gaseous Diffusion Plant. The purpose of the inspection was to determine whether activities authorized by the certificate were conducted safely and in accordance with NRC requirements. At the conclusion of the inspection, the inspectors discussed the findings with members of your staff.

Areas examined during the 6-week inspection period are identified in the report. Within these areas, the inspection consisted of a selective examination of procedures and representative records, interviews with personnel, and observations of activities in progress.

Based on the results of the inspection, the NRC has determined that a violation of NRC requirements occurred. The violation is cited in the enclosed Notice of Violation, and the surrounding circumstances are described in detail in the enclosed report. The violation is of concern because your corrective actions for previous similar violations did not prevent the following: 1) multiple failures to properly use electronic personal dosimeters during criticality accident alarm system outages, and 2) multiple situations in Building X-705 in which inadvertent containers could have accumulated unsafe masses and geometries of fissile material.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosures will be available **electronically** for public inspection in the NRC Public Document Room **or** from the *Publicly Available Records (PARS) component of NRC's document system (ADAMS)*. *ADAMS is accessible from* the NRC Web site at http://www.nrc.gov/NRC/ADAMS/index.html (the Public Electronic Reading Room).

We will gladly discuss any questions you have concerning this inspection.

Sincerely,

/RA/

Patrick L. Hiland, Chief
Fuel Cycle Branch

Docket No. 07007002
Certificate No. GDP-2

Enclosures: 1. Notice of Violation
2. Inspection Report 07007002/2001-007 (DNMS)

cc w/encls: P. D. Musser, Portsmouth General Manager
P. J. Miner, Manager, Regulatory Affairs/Commitment Management, Portsmouth
H. Pulley, Paducah General Manager
S. A. Toelle, Director, Nuclear Regulatory Affairs, USEC
Portsmouth Resident Inspector Office
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NOTICE OF VIOLATION

United States Enrichment Corporation
Portsmouth Gaseous Diffusion Plant

Docket No. 07007002
Certificate No. GDP-2

During an NRC inspection conducted from July 31, 2001, through September 10, 2001, a violation of NRC requirements was identified. In accordance with the "General Statement of Policy and Procedure for NRC Enforcement Actions," NUREG-1600, Revision 1, the violation is listed below:

Title 10 of the Code of Federal Regulations Part 76.93, "Quality Assurance," requires, in part, that the corporation establish, maintain and execute a Quality Assurance Program (QAP).

Section 2.16 of the QAP, "Corrective Action," requires in part that conditions adverse to quality (CAQs) are promptly identified and corrected as soon as possible, and significant conditions adverse to quality (SCAQs) have their causes identified and corrected to preclude recurrence.

Contrary to the above:

A. The Corporation failed to effectively correct, through February and April 2000, CAQ corrective action plans, the potential accumulation of unsafe volumes of uranium-bearing solution in Building X-705. This resulted in three nuclear criticality safety approval non-compliances and subsequent reportable events on August 14 and August 15, 2001.

B. The Corporation failed to effectively correct, through October 2000 CAQ and May 2001 SCAQ corrective action plans, problems with electronic personnel dosimeter usage during criticality accident alarm system outages. This resulted in three non-compliances with Technical Safety Requirements limiting conditions of operation.

This is a Severity Level IV violation (Supplement VI). **(VIO 070-07002/2001-007-01)**

The NRC has concluded that information regarding the reasons for Violation 07007002/2001-007-01, the corrective actions taken and planned to correct the violation and prevent recurrence, and the date when full compliance will be achieved are already adequately addressed in this Inspection Report. Therefore, a specific response to Violation 0707002/2001-007-01 is not required. However, you are required to submit a written statement or explanation, pursuant to 10 CFR 76.70, if the description therein does not accurately reflect your corrective actions or your position. In that case, or if you choose to respond, clearly mark your response as a "Reply to a Notice of Violation," and send it to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, D.C. 20555 with a copy to the Regional Administrator, Region III, and a copy to the NRC Resident Inspector at Portsmouth, within 30 days of the date of the letter transmitting this Notice of Violation (Notice).

If you contest this enforcement action, you should also provide a copy of your response, with the basis for denial, to the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555-0001.

Because your response will be placed in the NRC's Public Electronic Reading Room (PERR), to the extent possible, it should not include any personal privacy, proprietary, classified, or safeguards information so that it can be placed in the PERR without redaction. If personal privacy or proprietary information is necessary to provide an acceptable response, please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request withholding of such material, you must specifically identify the portions of your response that you seek to have withheld and provide, in detail, the basis for your claim of withholding (for example, explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.790(b) to support a request for withholding confidential commercial or financial information). If classified or safeguards information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21.

In accordance with 10 CFR 19.11, you may be required to post this Notice within two working days.

Dated this 27th day of September, 2001

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No:	07007002
Certificate No:	GDP-2
Report No:	07007002/2001-007 (DNMS)
Facility Operator:	United States Enrichment Corporation
Facility Name:	Portsmouth Gaseous Diffusion Plant
Location:	3930 U.S. Route 23 South P.O. Box 628 Piketon, OH 45661
Dates:	July 31, 2001, through September 10, 2001
Inspectors:	David J. Hartland, Senior Resident Inspector Stephen R. Caudill, Resident Inspector Monte P. Phillips, Senior Fuel Cycle Inspector
Approved By:	Patrick L. Hiland, Chief Fuel Cycle Branch Division of Nuclear Materials Safety

EXECUTIVE SUMMARY

United States Enrichment Corporation
Portsmouth Gaseous Diffusion Plant
NRC Inspection Report 070-07002/2001-007(DNMS)

Operations

One violation was cited for failure to implement effective corrective actions to preclude recurring nuclear criticality safety approval (NCSA) and Technical Safety Requirement (TSR) violations. (Section O1.1)

The inspectors identified an inappropriate use of a daily operating instruction (DOI), when the DOI was used to circumvent a deficient procedure. The example was isolated, and the plant staff took appropriate action to correct the deficiency. (Section O1.2)

The inspectors identified an issue regarding inconsistency in the definition of a fluorinating environment in the NCSA and nuclear criticality safety evaluation (NCSE) governing cascade operations. Plant staff was assessing revisions to the affected documents to address the issue. (Section O1.3)

Maintenance

Operators did not use the correct procedure section for removing the pigtail connection from a cold trap cylinder in Building X-343. Also, the procedure contained at least one inadequate step that rendered the procedure unusable to accomplish its intended purpose. (Section M1.1)

Plant Support

The Employee Concerns Program (ECP) and Corrective Action Program (CAP) improvement initiatives were thorough and implemented as planned. The backlogs were low, and investigations were thorough and timely. The plant staff was not reluctant to identify perceived safety issues. (Sections C6.1-C6.3)

The internal exposure monitoring and control programs were being effectively implemented in accordance with regulatory requirements. No individual at the site had exceeded the uranium toxicity limit for soluble uranium as specified in 10 CFR 20.1201(e). (Section R.1)

The effluent and environmental monitoring programs were being effectively implemented in accordance with regulatory requirements. Sampling and analyses programs adequately monitored the environmental impact of airborne and liquid emissions for determining doses to members of the public. (Section V.1)

Generally, waste storage containers were in good material condition, and criticality controls were being observed. While solid waste was disposed of on a regular basis, liquid materials had been in storage for significant periods due to the inability to dispose of them except in small batches. (Section W.1)

Report Details

I. Operations

O1 Conduct of Operations

O1.1 Corrective Action Deficiencies

a. Inspection Scope (88100)

The inspectors reviewed the adequacy of the plant staff's corrective actions to various issues and events.

b. Observations and Findings

The inspectors identified two areas where the plant staff's corrective actions were ineffective in preventing multiple recurrences of Nuclear Criticality Safety Approval (NCSA) and Technical Safety Requirements (TSR) violations.

NCSA VIOLATIONS

During an August 13 tour of Building X-705, the inspectors identified the following violations of NCSA 0705-076.A-03, "Use of Inadvertent Containers":

- A large sheet of plastic wrap was found on a shelf near the Microfiltration control panel, deformed in such a way that an unsafe mass and geometry of uranium-bearing solution (i.e., greater than 2.5 liters at a pooled depth greater than 1.5 inches) could potentially accumulate within the folds.

- A pump with an uncovered opening was on the same shelf (above), which had the potential to accumulate more than 2.5 liters of uranium-bearing solution in the event of an overhead leak.

Subsequently, work in Building X-705 was suspended, and building management conducted walk-downs to see if other NCSA violations existed. A small opening was identified in the top of a calciner glovebox where an instrumentation cable had penetrated. The plant staff determined that the opening could have allowed uranium-bearing solution to accumulate inside the glovebox, which had an unfavorable geometry for fissile material. This violated NCSA 0705-024.E02, "Calciner Solution Recovery."

For each of the above NCSA violations, the plant staff responded in accordance with Procedure XP2-EG-NS1031, "Nuclear Criticality Safety." Specifically, the plant staff established boundaries around the affected areas and equipment, notified the Plant Shift Superintendent (PSS) and Nuclear Criticality Safety (NCS) staff, issued problem reports (PR's), conducted incident investigations, and made the required Bulletin 91-01 reports to the NRC within 24 hours.

The deficiencies were corrected after NCS engineers evaluated the situations. Specifically, the plastic sheeting and pump (as well as the entire shelf) were removed from the affected area, and the hole in the calciner glove box was taped over. The plant staff developed several long-term corrective measures to preclude additional

non-compliances. Physical locations covered by NCSA 0705-076.A-03 will now be marked with green plastic chains. Entry control points into these locations will have posted instructions on inadvertent container rules. In the case that potential inadvertent containers would be needed in the area, the First Line Manager (FLM) must approve an "inadvertent container verification" checklist initiated by the operator. The potential inadvertent containers brought into the area will be tracked by a log sheet, and routine management safety walk-downs will require inspection of the logged-in items to ensure NCSA compliance.

The NRC had previously identified problems with NCSA inadvertent containers (particularly with respect to plastic wrap) in Inspection Reports 07007002/2000-001, 07007002/2000-002, and 07007002/2000-006. The plant staff had developed condition adverse to quality (CAQ) corrective action plans to address these previous concerns; however, the actions taken were ineffective in preventing recurrence, as discussed above.

TSR VIOLATIONS

During this inspection period, the plant staff identified three TSR violations involving Criticality Accident Alarm System (CAAS) outage limiting conditions of operation (LCOs). For areas where the maximum foreseeable absorbed dose in free air exceeded 12 rad, LCO 2.2.3.2b (applies in Building X-330) and LCO 2.8.3.1b (applies in Building X-710) had action steps which require, during CAAS outages, an alternate means of criticality alarm notification on sensing a 10 millirem (mr) per hour dose rate. These LCO action steps had been proceduralized to require the use of an electronic personnel dosimeter (EPD) in the affected area. If the affected area also required hearing protection, the procedure required EPDs with earpieces and earmuffs for audibility. The three violations included:

- On August 1, during a CAAS change-out in Building X-710, an employee entered the building without an EPD.

- On August 2, during the same CAAS change-out mentioned above, an employee entered Building X-102, also without an EPD.

- On August 17, during a CAAS change-out in Building X-330, three employees entered high noise areas without EPD earpieces and earmuffs. The inspectors noted that these problems were identified by plant management during "field day" safety tours.

The NRC had previously raised concerns about proper EPD usage during CAAS outage LCOs in Inspection Reports 07007002/2000-010 and 07007002/2001-005. In May 2001, a significant condition adverse to quality (SCAQ) corrective action plan was developed to address these concerns, yet it was ineffective in preventing these recurring TSR violations. The May 2001 corrective actions included procedural revision, enhanced training, tighter control of EPD issuance, and other programmatic improvements. Despite these past corrective actions, inadequate procedural compliance was a primary factor in the current violations. To address this, the plant staff will step up the implementation of a separate corrective action plan developed to

address procedural compliance. As a further preventive measure, the plant staff will assess whether certain cascade areas have overlapping CAAS coverage, so that EPDs with earpieces will not be necessary during LCOs.

Title 10 of the Code of Federal Regulations Part 76.93, "Quality Assurance," required, in part, that the Corporation establish, maintain and execute a Quality Assurance Program (QAP). Section 2.16 of the Portsmouth QAP, "Corrective Action," required, in part, that CAQs be promptly identified and corrected as soon as possible, and SCAQs have their causes identified and corrected to preclude recurrence. The corrective actions implemented to date were not effective in preventing three NCSA inadvertent container violations and three CAAS outage TSR violations, as described above. This is a **violation**. **(VIO 070-07002/2001-007-01)**

c. Conclusions

One violation was cited for failure to implement effective corrective actions to prevent recurring NCSA and TSR violations. A response will not be required based on the adequacy of immediate corrective measures, and the inspectors will continue to assess the effectiveness of long-term preventive measures to be implemented.

O1.2 Inappropriate Use of Daily Operating Instruction

a. Inspection Scope (88100)

The inspectors observed operations to assess compliance with procedures and other certificate requirements.

b. Observations and Findings

On August 20, during a review of daily operating instructions (DOIs), the inspectors observed that one item included in the Building X-330 DOIs provided instructions that should have been included in an approved procedure. DOIs were issued by management to provide short-term direction to plant personnel including schedule changes, equipment status, and other similar information but were not to be used to replace guidance in approved procedures.

The DOI at issue provided additional guidance to operators regarding chemical treatment of a deposit adjacent to a booster pump. The DOI stated that if the booster pump should trip, the block valves would automatically close, and the valves needed to be immediately re-opened to restore the monitoring capability for the deposit. The DOI also required operators to terminate the treatment if the average temperature of the monitored points reached 250 degrees Fahrenheit, although the procedure required termination if any one point reached 280 degrees Fahrenheit. The inspectors learned that this action was taken to prevent the booster pump from automatically tripping due to high temperature.

The inspectors noted that the automatic trip function was engaged because the booster pump selector switch was in the "on" position, as required by the booster operation procedure referenced in the treatment procedure. However, the trip function was required for cascade operation. In summary, the inspectors determined that the plant staff was using the DOI as a means to circumvent the deficient treatment procedure.

As corrective action, the plant staff revised the treatment procedure to require that the selector switch be placed in the "off" position to disable the automatic trip function. The inspectors reviewed other DOI's on a plant-wide basis and identified no other inappropriate uses.

c. Conclusions

The inspectors identified an inappropriate use of a DOI, when it was used to circumvent a deficient procedure. The example was isolated, and the plant staff took appropriate action to correct the deficiency.

O1.3 Inconsistency In Defining Fluorinating Environment

a. Inspection Scope (88100)

The inspectors reviewed plant operations to assess compliance with nuclear criticality safety (NCS) requirements and other certificate requirements.

b. Observations and Findings

On August 26, while reviewing Problem Report (PR) 01-03844 regarding the issue of obtaining a conditioning agent negative on Cell 33-8-8 following treatment, the inspectors questioned compliance with NCSA 0333-015, "Cascade Operations in the X-333 Building." The inspectors noted that a uranium hexafluoride (UF_6) negative had been obtained more than two weeks prior, but the cell had not been buffered with dry air to greater than 14 pounds per square inch absolute (psia) within 72 hours as required by the NCSA. Also, the inspectors noted that the plant shift supervisor (PSS) did not address the NCSA compliance issue during review of the problem report.

The inspectors discussed the issue with the on-shift PSS, and an anomalous condition report was initiated. The response to that report documented that a violation of the NCSA did not occur, as a fluorinating environment as defined in the Nuclear Criticality Safety Evaluation (NCSE) was maintained. The NCSE defined a fluorinating environment as measurable concentrations of conditioning agent or UF_6, and sample results indicated that measurable amounts of conditioning agent existed in the cell.

The inspectors did not challenge this conclusion, but noted that the NCSA control requiring the cell to be buffered after the UF_6 negative was obtained was the control derived from the NCSA into the operating procedures. For example, once the UF_6 negative was obtained, the procedure for periodically sampling non-buffered cells to verify maintenance of a fluorinating environment was no longer applicable. In response, the plant staff was assessing revision to the NCSA and related procedures to ensure consistency with the NCSE definition of fluorinating environment.

c. Conclusions

The inspectors identified an issue regarding inconsistency in the definition of a fluorinating environment in the NCSA and NCSE governing cascade operations. The plant staff was assessing the need to revise affected documents.

O8 Miscellaneous Operations Issues

O8.1 Certificatee Event Reports (90712)

The certificatee made the following operations-related event reports during the inspection period. The inspectors reviewed any immediate safety concerns indicated at the time of the initial verbal notification, and they will evaluate the associated written reports for the events following submittal, as applicable.

Number	Date	Status	Title
38184	8/03/01	Closed*	Notification to other government agency of vehicle accident on Perimeter Road involving injuries and one fatality.
38239	8/27/01	Open	Safety System Actuation, Building X-344 Autoclave No. 1, Cylinder High Pressure shutdown.

* The NRC reviewed this event and has no further issues. No 30-day report to the NRC is required.

O8.2 Bulletin 91-01 Reports (97012)

The certificatee made the following reports pursuant to Bulletin 91-01 during the inspection period. The inspectors reviewed any immediate NCS concerns associated with the report at the time of the initial verbal notification. The two events reported during this report period were considered examples of ineffective corrective actions as discussed in section O.1.1.b of this report. The reports are considered closed.

Number	Date	Title
38205	8/14/01	24-Hour Report - NCS violations; in Building X-705, plastic material not configured or secured to prevent deforming was discovered in an inadvertent container area, and a pump with a dislodged flange created a second potential inadvertent container.
38215	8/15/01	24-Hour Report - NCS violation; in Building X-705, a hole was discovered in the top of the calciner glove box, which could have allowed uranium-bearing solution to accumulate.

O8.3 (Closed) Event Report 37756 (01-02): High condensate level shutoff actuation on Autoclave No. 1 in Building X-343. The plant staff determined that the root cause was a closed trap drain valve that allowed the autoclave steam supply header to accumulate excess condensate. A contributing cause was believed to be an incorrectly positioned condensate drain bypass valve, which could have resulted in the early closure of a temperature control valve during autoclave heat-up. As corrective action, applicable autoclave operating procedures were revised to provide requirements for correctly

positioning the condensate bypass valves, and a lock and tag was placed on the steam trap drain valve. The inspectors have no further issues and this item is closed.

O8.4 (Closed) URI 70-7002/2001-002-02: Review of applicability of normal lighting to TSR 3.23 and the adequacy of controls for maintaining the lighting. The plant staff determined that the appropriate level of rigor was not being applied to normal lighting in regards to TSR 3.23. As corrective action, the plant staff developed a procedure that provided surveillance requirements for maintaining normal lighting for emergency egress in the appropriate UF_6 process areas. The inspectors have no further issues and this item is closed.

II. Maintenance

M1.1 Operational Safety Review (88103)

a. Inspection Scope

The inspectors observed selected maintenance activities to verify the activities were conducted safely and in accordance with regulatory requirements.

b. Observations and Findings

The inspectors observed operations in Building X-343, where operators were to remove the pigtail connection between a cold trap cylinder and the associated supply header so that a thermocouple could be checked. Subsequently, the operators were to attach the pigtails for both inlet and outlet connections to all three cylinders on another cold trap.

The first evolution was to remove the pigtail connection for the “A” cold trap cylinder. This evolution was to have been accomplished in accordance with Section 8.8 of Procedure XP4-TE-FD2810, “X-343 Cold Trap Cylinder Operations.” Sections 8.8, 8.9, and 8.10 involved removal of pigtails from the “A”, “B”, and “C” cylinders respectively. Similarly, Section 8.7 of that procedure involved removal of the pigtails from all three cylinders simultaneously.

The operator reading the steps of the procedure began in the wrong section of the procedure, namely Section 8.7 instead of Section 8.8. Procedural step 8.7.8 was different from corresponding step 8.8.8. Specifically, step 8.8.8 directed closing the valves on the cylinder in the “A” position; step 8.7.8 directed closing all cylinder valves. Also, step 8.7.11 was different from the corresponding step 8.8.12 in that step 8.7.11 specified that the cold trap evacuation valve switch be placed open, while 8.8.12 had the same valve closed (the valve was already in the closed position from implementation of either step 8.7.4 or 8.8.4).

At step 8.7.14 (corresponding step 8.8.15), the cold trap air purge valve was opened to pressurize the lines to a pressure greater than 50 psia. The inspectors noted that the valve was closed when the pressure reached approximately 54.5 psia. The next step (8.7.15) was to open the trap inlet valve and observe the pressure drop to less than 5.5 psia while the air in the lines was pulled out via the air ejector with the cold trap evacuation valve open. At this point, the first line manager (FLM) arrived, and noted that the time interval to pull the pressure down to 5.5 psia was excessive. The FLM checked the lineup and determined that the lineup was incorrect for the procedure.

Specifically, the “B” and “C” cylinder bypass valves were closed, and the “B” and “C” cylinder inlet and outlet valves were open.

At this point in the evolution, the operator reading the instructions identified that the wrong section of the procedure was being followed and jumped to Section 8.8. However, when the operators attempted to complete the procedure in the correct section, the fact that the cold trap evacuation valve was specified to be closed at step 8.8.12, made it impossible to reduce the pressure on the cold trap system once pressurized to greater than 50 pounds with air at step 8.8.15. The FLM realized the procedure was in error, stopped the evolution, and put a hold on the procedure until it could be revised.

The inspectors noted that this procedure had only received a table-top verification and validation prior to implementation. The procedure had not been walked-down in the field prior to implementation because at the time the procedure was finalized, the equipment had not been completely installed. As a result, the FLM initiated two Problem Reports, one to address the procedure inadequacy and the other to address inadequate procedure usage. The plant staff took appropriate action to address the PRs, including implementing a revision to the procedure. Since both violations (inadequate procedure usage and inadequate procedure content), were identified by the certificatee and prompt corrective action was initiated, the violations are non-cited per Section VI.A.8 of the NRC’s Enforcement Policy.

c. Conclusions

Operations personnel did not use the correct section of a procedure to remove the pigtail connection from a cold trap cylinder in Building X-343. Also, the procedure contained at least one inadequate step that rendered it unusable to accomplish the intended purpose. This was due to an inadequate field verification and validation of the procedure. Facility management took immediate corrective action to address the issues.

III. Engineering

E8 Miscellaneous Engineering Issues

E8.1 (Closed) Event Report 37872 (01-05): High condensate level shutoff actuation on Autoclave No. 4 in Building X-344. The plant staff determined that the root cause was accumulation of debris on the steam trap screen due to an inadequate cleaning frequency. A screen with a smaller mesh size was installed during the autoclave upgrade project without recognizing the need to clean the screen more frequently. As corrective action, the cleaning frequency was revised and a “lessons learned” was issued to appropriate engineering personnel. The inspectors have no further issues and this item is closed.

IV. Plant Support

C6 Miscellaneous Plant Support Issues

C6.1 General Inspection Scope

Over the past two years, the NRC and the United States Enrichment Corporation (USEC) have met and corresponded on several occasions to discuss Safety Conscious Work Environment (SCWE) issues. On June 29, 1998, the NRC and USEC met to review the results of USEC's independent SCWE survey and assessment. At that meeting, USEC identified the Employee Concerns Program (ECP) and Corrective Action Program (CAP) as areas that warranted improvement. Management meetings between the NRC and USEC were also held on January 25, 1999, and October 18, 2000, to discuss USEC's continued efforts to assess and improve the SCWE. At the October 2000 management meeting, USEC noted that the ECP was "rated as 'nominally less-than-adequate' with a steady trend." Also, the most recent Certificatee Performance Review identified the outreach for management and staff to raise safety concerns, and problem identification and resolution as areas warranting improvement.

During this inspection period, the NRC reviewed the ECP, SCWE, CAP, and related improvement initiatives. For a general overview, the inspectors discussed the survey results and related improvement initiatives with the PORTS General Manager, the Nuclear Regulatory Affairs (NRA) Manager, and USEC SCWE Program Manager. The inspectors noted that the initiatives addressed the issues discussed in the October 2000 meeting and were in the process of being implemented. Specific program reviews are described in the following sections.

C6.2 Employee Concerns Program

a. Inspection Scope (40001)

The inspectors interviewed the ECP Manager to determine the frequency of employee contact, the thoroughness of investigations, case backlog, compliance with governing procedures, recent ECP trends, and administrative aspects of the program. Due to the proprietary nature of the specific content of the investigations, the observations will not be discussed in detail. The inspectors reviewed procedure UE2-HR-EO1035, Rev. 2, "Employee Concerns," dated August 15, 2001.

b. Observations and Findings

The inspectors reviewed the ECP investigations from July 1, 2000 to August 20, 2001. The ECP investigations were thorough and in accordance with procedures. Nuclear safety and related concerns received high priority and were addressed in a timely manner. Relevant subject matter experts were consulted for assistance, when necessary. For the investigations reviewed, about half were identified through the exit interview process. The inspectors noted that bi-weekly follow-up contact with the concerned individual (CI) was not being done for exited CI's. This observation was subsequent to a self-identified PR stating that exited CI's were not being sent the written results of the investigation. Accordingly, the ECP manager filed a PR to review the procedure and revise if necessary to clearly specify the requirements for contacting exited CI's.

Regarding visibility, the ECP Manager routinely taught SCWE courses, and attempted to spend several hours per week in the plant to maintain general staff contact. The approximately 80 official plant bulletin boards had posters informing the staff of the ECP Manager's mail stop and telephone number, and the front page of the in-house daily news bulletin also published this information. The inspectors observed several outdated ECP-related postings and submittal forms, from both Department of Energy (DOE) and previous facility contractors, which had the potential to dilute current USEC initiatives to emphasize the visibility of the ECP. Two PR's were filed on this matter, with recommended actions to tour the buildings to remove all outdated ECP postings and forms.

As a result of ECP deficiencies identified by the SCWE surveys, and by recent years' trends of concerns sent to external agencies, USEC had instituted an action plan to increase the effectiveness of the ECP. The progress and due dates were being tracked in the Business Prioritization System (BPS). The inspectors reviewed these actions, and found they were sufficient and were being completed as scheduled. Major elements of the action plan included:

- Redefining the role of the ECP to make it more visible and effective;
- SCWE training for all employees, and periodic re-training for supervisors;
- specialized training in investigative techniques for ECP and Human Resource investigators; and
- management communications on support for the SCWE and ECP.

c. Conclusions

The ECP improvement initiatives were thorough, and being implemented as planned. The backlog of employee concerns was low, and investigations were thorough and completed in a timely manner. Safety-significant concerns received high priority. The ECP procedure will be revised to clearly stipulate how to deal with concerns identified during exit interviews.

C6.3 Safety Conscious Work Environment

a. Inspection Scope (71152)

The inspectors interviewed 48 salaried and hourly employees selected in a quasi-random manner from various major organizations (i.e., operations, maintenance, and engineering). Questions were asked, in the context of nuclear safety, about the willingness of staff to raise concerns, the perceived effectiveness of the PR system, the visibility and use of the ECP, and related topics.

b. Observations and Findings

No one interviewed by the inspectors expressed any reluctance to raise a nuclear safety concern. All persons interviewed believed that an identified serious safety concern resulted in immediate corrective actions. A generally conservative philosophy existed, that if in doubt, the plant staff was encouraged to submit PRs. In hypothetical situations

where a safety concern continued unabated, several of the hourly employees first contacted a union safety representative instead of the ECP manager. Accordingly, the inspectors interviewed two union safety representatives, who stated that in these cases they filed the appropriate PR or met with either the ECP manager or management on behalf of the employee. Everyone understood that the ECP was an alternate way to raise safety issues, although most primarily associated it with resolving Human Resource concerns.

Several employees commented that industrial safety concerns (outdoor valves obscured by tall grass, inadequate lighting, etc.), identified as PRs, had not been resolved in a timely manner. Both the General Manager and NRA Manager agreed that, left uncorrected, this general sense of frustration could have a potential impact on the SCWE. The inspectors discussed this with the Maintenance Manager, and also observed during the inspection period that there had been an increased attention to grounds and building upkeep.

c. Conclusions

Based on the random sample of employees interviewed by the inspectors, the plant staff was not reluctant to identify perceived safety issues by using the established plant processes. The plant staff's responses to the inspectors' questions generally comported with the SCWE survey results.

C6.3 Corrective Action Program

a. Inspection Scope (71152)

The inspectors discussed with the NRA Manager initiatives to improve the corrective action program (CAP). The inspectors observed a PR Screening Committee meeting, and a Corrective Action Review Board meeting. The inspectors discussed with NRA staff the general administration of the CAP, including compliance with governing procedures, database software maintenance, tracking/trending, backlogs, and feedback to PR initiators.

b. Observations and Findings

The PR's were screened into appropriate categories and sub-categories to facilitate tracking and trending. A monthly report on PR data and trends was sent to relevant managers, and was also posted on the Intranet for general viewing. Having defined a backlog as either: 1) a Significant Condition Adverse to Quality (SCAQ) without a corrective action plan, or 2) an overdue SCAQ action, the inspectors observed that no significant backlog existed.

For a problem report resulting in a Condition Adverse to Quality (CAQ) or SCAQ, procedures required the closure actions to be communicated to the PR initiator. However, a non-quality PR did not require feedback to the initiator. As noted in the prior section, addressing non-quality PR's was an area of frustration which arose during the plant interviews.

The in-house daily news bulletin published an article describing the PR evaluation and resolution process. This article also contained how-to information on using the Intranet

to access PRs in the BPS database in order to view the status. Some organizations already had an assigned individual to assist employees in tracking their PR's, and this was also a recommendation from the CAP Improvement Team. However, a few employees, in the Maintenance and Utilities Departments, informed the inspectors that they did not have access to computers.

c. Conclusions

PORTS was implementing the CAP in accordance with Safety Analysis Report (SAR) and procedural requirements. The CAP backlog was low. An improvement action plan was underway to enhance the CAP.

R1. Radiological Protection (83822)

a. Inspection Scope

The inspectors reviewed selected data from the internal exposure control and monitoring program for the past year, reviewed internal dose computation technical basis documentation and associated procedures, and discussed internal dose monitoring program implementation and results with cognizant personnel in order to determine compliance with appropriate regulatory requirements. The inspectors also observed contamination control practices in the field to ensure procedural compliance.

b. Observations and Findings

The inspectors reviewed the internal dosimetry program procedure, XP2-HP-RP1034, "Urinalysis Program." The procedure specified the methodology for controlling the internal dose monitoring program, including when individuals would be required to submit bioassays. Plant staff whose regular duties required entry into radiologically contaminated areas or direct contact with radioactive material participated in the routine bioassay program.

A list was sent out to the various facilities on a frequency related to the individual's potential to receive an internal uptake, ranging from samples for specific jobs up to a 13-week sampling period. The sampling pool was designed so that individuals in the random pool would submit at least one sample during the sample period i.e., as individuals gave a sample, their name would be removed from the pool until all individuals in the pool had been sampled. A chain of custody was established once the sample had been collected to ensure that the results matched the correct individual. Given the recent reorganizations that had occurred, the health physics staff planned to reassess the entire site to decide which staff needed to continue in the bioassay sampling program, and whether the sampling frequency for staff needed adjustment based on recent job changes.

Lab sample results for the bioassays were reported to the health physics department for Uranium-235 and total uranium uptake. The health physics staff then calculated the internal exposure using industry standard algorithms. Trans-uranic isotopes [which were difficult to measure at levels below the legal dose thresholds] were included in the dose calculation based on historical presence at the site. Individuals working in Buildings X-705 or X-710 were assigned a transuranic factor of 2 percent, while all other locations were assigned a factor of 0.05 percent.

The procedure established two administrative action levels or trigger points where additional bioassay samples were to be collected: 0.5 and 5.0 micrograms per liter of uranium. Bioassay results greater than 450 micrograms per liter required further investigation per Procedure XP2-HP-RP1034. In addition, the procedure specified that an investigation be conducted into routine bioassay results that were in excess of 20 micrograms per liter to determine the source of exposure.

In cases where supplemental samples were collected, the subsequent bioassay sample results were compared to the uranium biological decay curve to determine the most likely date of uptake and then an internal dose and maximum uptake were calculated for the individual. In cases where the dose was greater than ten percent of the 10 CFR Part 20 limits, the health physics staff ensured the decay curves almost exactly matched to determine the assigned dose. In other cases, when the curves had less than a 10 percent difference, the dose was assigned.

The inspectors reviewed internal dosimetry data for selected individuals who had shown positive results and determined that the doses were accurately calculated and assigned to the respective individuals. In all cases, the sample results indicated that the intakes were less than the toxicity limit for soluble uranium contained in 10 CFR 20.1201(e). All re-samples for bioassays above the trigger levels were conducted as required.

The inspectors observed contamination control activities in Buildings X-705 and X-343. In all cases, individuals wore proper protective clothing and demonstrated proper contamination controls. Frisking was done upon exiting the controlled areas to ensure that individuals were not spreading residual contamination outside of the control areas.

c. Conclusions

The inspectors concluded that the internal exposure monitoring and control programs were being effectively implemented in accordance with site procedures and regulatory requirements. No individual at the site had exceeded the uranium toxicity limit for soluble uranium specified in 10 CFR 20.1201(e).

V1. Environmental Protection (88045)

a. Inspection Scope

The inspectors reviewed the programs for the assessment of releases of radioactive airborne emissions and liquid effluents. The inspectors also evaluated the environmental and effluent monitoring program for the assessment and characterization of radiological contaminants in the environs surrounding the site. The main areas reviewed were the environmental assessment program for soil, sediment, water, vegetation, ambient air, food stuffs, and direct radiation; and the sampling and assessment of airborne emissions and liquid effluents through controlled release pathways. The programs were reviewed to verify compliance with the SAR and 10 CFR Part 20.

b. Observations and Findings

The radiological environmental monitoring programs were conducted to assess the impact of the facility operations on the environment in the immediate vicinity of the plant site. This program, and the results from the certificatee's effluent monitoring program, were used to assess exposures to members of the public. Sample locations were as shown in Section 5.1 of the SAR. Baseline Effluent Quantities (BEQs) were established based on expected effluent values. The BEQs were well below the 10 CFR Part 20, Appendix B limits, and were used to identify abnormal discharges from outfalls and determine the cause for the abnormality before any effluents could exceed 10 CFR Part 20 limits.

Ambient Air

Because DOE wanted several non-radiological parameters monitored, USEC transferred the ambient air monitoring program to DOE in October 2000. The last samples collected and analyzed by USEC were for the third calendar quarter of 2000. The certificatee had requested NRC permission to change the SAR to remove ambient air from environmental monitoring programs under USEC control. For the portion of calendar year 2000 that USEC did monitor ambient air at the 14 permanent sample collection stations referenced in the NRC's Inspection Report No. 07007002/2000-004 dated March 27, 2000, no sample result was in excess of 0.15 picocuries per cubic meter gross beta.

Soil

Soil samples from 22 locations surrounding the site were collected during the spring and fall and analyzed to monitor the environmental impact of the plant's emissions on the soil. In addition, nine samples within the perimeter fence were also collected in the spring and fall for analysis. The analyses performed included total uranium, gross beta, gross alpha, and technetium-99. The results were reviewed and placed in a spread sheet program comparing sample results at the same location over the past several years. Action levels were established that would trigger further review based on previous year's data and the results of the four remote sample locations.

During the review of the spreadsheet data for soil samples, the inspectors noted that the results for total uranium were significantly higher for samples collected in 2000 versus those collected in all prior years. Results shown in the spreadsheet averaged three times higher than prior years at all sample locations, including the background locations. Upon further investigation, the individual responsible for maintaining the spreadsheet determined that he had made a transposition error in copying laboratory analysis results into the spreadsheet, with none of the 2000 data shown on the spreadsheet actually corresponding to the analyzed results.

After the error was corrected, the inspectors reviewed the data again and determined that the results were similar to prior year readings at all locations, and no trigger levels were exceeded at any location. The inspectors determined that the comparison of data to the target levels had been conducted when the results were received from the laboratory, and that no one had reviewed the cumulative tables contained in the spreadsheet until the tables were reviewed by the inspectors. The inspectors identified a weakness in that the plant staff had not adequately reviewed the data in the

spreadsheet for accuracy, nor had they reviewed the cumulative data to look for trends in increasing activity that could have been occurring slowly over the past several years.

Sediment

Sediment samples from 12 locations surrounding the site were collected during the spring and fall and analyzed to monitor the environmental impact of the plant's emissions. Sediment samples were analyzed for the same constituents as soil samples. Action levels were also established based on previous years' data and the results of upstream sediment samples. The inspectors reviewed the results of sediment samples over the past several years and noted that there were no significant differences in results for the same sample locations over the time period reviewed (1993 through 2000). The maximum activity detected in a sediment sample was 23.7 picocuries per gram at the downstream location in Big Beaver Creek.

Vegetation/Produce

Vegetation samples were collected semiannually from the same locations where soil samples were collected. Samples were analyzed for technetium-99 and total uranium. When available, produce samples (corn, lettuce, soybeans, etc.) were also collected from local farmers and gardeners and analyzed for total uranium and technetium-99. As for soil, action levels were established based on previous years' data and the results from background samples. The inspectors reviewed the results of vegetation and produce samples over the past several years and noted that there were no significant differences in results for the same sample locations over the time period reviewed (1993 through 2000).

Food Stuffs

As part of its environmental monitoring program, fish were caught from effluent streams, and on occasion, deer or other hunted animals were taken and food portions of the animals were analyzed for total uranium, gross alpha, gross beta, and Technetium-99. The inspectors reviewed the results of samples analyzed over the past several years and noted that there were no significant differences in results for the same animal types over the time period reviewed, and in the case of fish, no sample result showed detectable radioactivity.

Direct Radiation

The certificatee maintained 19 locations surrounding the facility where external gamma radiation was monitored. Direct radiation monitoring was conducted using thermoluminescent dosimeters (TLDs). Dosimeters were posted and collected quarterly, and then sent to an offsite contractor that was accredited by the National Institute of Standards and Technology's National Voluntary Laboratory Accreditation Program. The inspectors reviewed the results of direct radiation monitoring over the past several years and noted that there were no significant differences in results for the same sample locations over the time period reviewed. Dose rates were all essentially identical to background readings (locations that were more than ten miles from the site) at approximately 12 micro roentgens per hour with one exception. The monitoring station adjacent to Building X-874 within the controlled area fence routinely showed an average dose rate of approximately 75 micro roentgens per hour. At this exposure rate,

an individual would have to stand at that location within the security fence for more than 1,333 hours to exceed the public dose limit of 100 millirem.

Airborne Effluent Monitoring

The inspectors reviewed the calculated public exposure results that had been developed by the site using the Environmental Protection Agency's CAP88 computer program. The program took into account all effluents (airborne and liquid) and exposure pathways (inhalation, ingestion, and direct exposure) and calculated the maximum dose to the maximum exposed individual. For 2000, the combined exposure for all pathways to the maximum exposed individual was 0.047 mr, compared to the 10 CFR Part 20 limit of 100 mr. Total measured releases from the site were 2.86 E-2 curies of uranium-234, 8.78 E-4 curies of uranium-235, 2.6 E-3 curies of uranium-238, and 5.66 E-2 curies of technetium-99. All release values were less than 10 CFR Part 20 Appendix B limits.

Liquid Effluent Monitoring

Effluent water generated at the site, other than rain runoff, was processed through the sewage treatment facility. Wastewater coming from decontamination and cleaning activities in Buildings X-700 and X-705 was also processed through the sewage treatment facility. Rain runoff discharged through one of seven remaining outfalls from the site. All water discharged eventually ended up in the Scioto River. Only the sewage treatment facility routinely discharged effluents from the Portsmouth facility. The remaining outfalls essentially served as storm drain collection points, and discharged only when rainfall was sufficient to overflow the outfall basin. USEC also collected environmental samples from both upstream and downstream locations in Little Beaver Creek, Beaver Creek, and the Scioto River.

The inspectors visited all eight outfalls and observed facility personnel collect weekly composite and grab samples from the outfall sampling points. Samples collected were from a compositor, which took a small sample from the outfall every fifteen minutes to an hour. The inspectors had no concerns over the samples taken for radiological analysis. The compositor probe was located in the outfall such that it collected a representative sample from the outfall. A problem was observed with the sewage treatment effluent sampler in that the compositor was empty and a grab sample had to be collected. The tygon tubing from the sample collection point to the sampler had developed a crack, preventing the sample pump from pulling a sample from the outfall. The plant staff collecting the sample promptly repaired the tubing and verified the operability of the compositor subsequent to the repair.

The inspectors reviewed the results of liquid effluent monitoring samples over the past several years and noted that there were no significant differences in results for the same sample locations over the time period reviewed (1993 through 2000). The maximum activity detected in an effluent sample was 442 picocuries per liter for technetium-99, and 423 picocuries per gram gross beta activity. These results were well below the effluent release limits specified in 10 CFR Part 20, Appendix B.

c. Conclusions

The certificatee was implementing its certificate requirements in the conduct of its effluent and environmental monitoring programs. All sampling and analyses programs

inspected adequately monitored the environmental impact of the facility's airborne and liquid emissions for the determination of doses to members of the public. In all cases, the computed dose to the maximum exposed individual member of the public was below 1 millirem.

W.1 Radioactive Waste Management (84850, 84900)

a. Inspection Scope

The inspectors reviewed the storage of radioactive waste to verify compliance with requirements. The review included observations of the storage of material to assess the adequacy of the criticality controls, observation of the material condition of the facility and material being stored in the facility, and discussions with cognizant personnel.

b. Observations and Findings

The material condition of the waste storage areas was good. There was no evidence of water intrusion into the building or significant degradation of equipment or containers. The inspectors identified two B-25 boxes that had been returned empty from a vendor and showed significant deformation. The inspectors showed these two boxes to waste management staff, who noted that the boxes shouldn't have been returned and stated that the boxes would not be used for future shipments.

The personnel in the area were knowledgeable. The inspectors verified compliance with posted criticality controls by randomly checking that uranium mass and assay were quantified and documented on tags attached to the containers. While the inspectors found that the value listed on the tag did not always match the final value assigned to the container based on a completed non-destructive assay measurement, in all cases the value on the tag was conservative in overestimating the amount of U-235 that could be present in the waste.

The inspectors reviewed thirteen randomly selected records for waste storage containers and verified that the contents were traceable to the container, and that the mass limits complied with applicable NCSA's. The physical and chemical characteristics of the containers were properly documented.

While the solid waste containers were being routinely shipped offsite for disposal, liquid waste containers going back as far as 1997 were still on site. Plant personnel stated that liquid waste was normally sent to a vendor for incineration; however, the vendor was limited to 350 grams of U-235 by its license. As such, the vendor would contact its various clients when it could accept waste contaminated with U-235 to ensure that it remained within its license limits. This severely restricted the amount of liquid waste that could be sent offsite for disposal.

c. Conclusions

No significant issues were identified. Generally, storage containers were in good material condition. Criticality controls were being observed regarding spacing and mass controls for the material. While solid waste was disposed of on a regular basis, the inspectors did note that liquid materials had been in storage for significant periods of time due to the inability of the site to dispose of material except in small batches.

V. Management Meetings

X1 Exit Meeting Summary

The inspectors presented the inspection results to members of the facility management on September 10, 2001. The facility staff acknowledged the findings presented and indicated concurrence with the facts, as stated. The inspectors asked the plant staff whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

PARTIAL LIST OF PERSONS CONTACTED

United States Enrichment Corporation

P.Musser, General Manager
* J. Anzelmo, Plant Services Manager
* D. Couser, Training Manager
* L. Cutlip, Engineering Manager
* D. Fosson, Operations Manager
* S. Fout, Transfer and Shipping Plant Manager
* R. Lawton, Nuclear Safety & Quality Manager
* P. Miner, Nuclear Regulatory Affairs Manager
* M. Wayland, Maintenance Manager
* G. Workman, Production Support Manager

* Denotes those present at the exit meeting on September 10, 2001.

INSPECTION PROCEDURES USED

IP 40001:	Resolution of Employee Concerns
IP 71152:	Identification and Resolution of Problems
IP 88100:	Plant Operations
IP 88103:	Maintenance
IP 83822:	Radiation Protection
IP 84850:	Radioactive Waste Management - Inspection of Waste Generator Requirements of 10 CFR Part 20 and 10 CFR Part 61
IP 84900:	Low-Level Radioactive Waste Storage
IP 88045:	Environmental Protection
IP 90712:	In-office Reviews of Written Reports on Non-routine Events

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened	Item Type	Summary
38239	CER	Safety System Actuation, Building X-344 Autoclave No. 1, Cylinder High Pressure shutdown.
Closed		
07007002/2001-007-01	VIO	Ineffective corrective actions to prevent recurring NCSA and TSR non-compliances.
37756 (01-02)	CER	High condensate level shutoff actuation on Autoclave No. 1 in Building X-343.
70-7002/2001-002-02	URI	Review of applicability of normal lighting to TSR 3.23 and the adequacy of controls for maintaining the lighting.
37872 (01-05)	CER	High condensate level shutoff actuation on Autoclave No. 4 in Building X-344.
Discussed		
None		

LIST OF ACRONYMS USED

ADAMS	Agency-wide Documents Access and Management System
BEQ	Baseline Effluent Quantities
	Business Prioritization System
CAAS	Criticality Accident Alarm System
CAP	Corrective Action Plan
CAQ	Condition Adverse To Quality
CARB	Corrective Actions Review Board
CER	Certificate Event Report
CFR	Code of Federal Regulations
CI	Concerned Individual
DNMS	Division of Nuclear Material Safety
DOE	Department of Energy
ECP	Employee Concerns Program
ECR	Engineering Change Request
FLM	First Line Manager
GDP	Gaseous Diffusion Plant
LCO	Limiting Condition of Operation
NCS	Nuclear Criticality Safety
NCSA	Nuclear Criticality Safety Approval
NCSE	Nuclear Criticality Safety Evaluation
No.	Number
NRA	Nuclear Regulatory Affairs
NRC	Nuclear Regulatory Commission
PARS	Publicly Available Records
PERR	Public Electronic Reading Room
PORTS	Portsmouth Gaseous Diffusion Plant
PR	Problem Report
psia	Pounds per square inch absolute
PSS	Plant Shift Superintendent
QAP	Quality Assurance Program
SAR	Safety Analysis Report
SCAQ	Significant Condition Adverse to Quality
SCWE	Safety Conscious Work Environment
TLD	Thermoluminescent Dosimeter
TSR	Technical Safety Requirement
URI	Unresolved Item
UF_6	Uranium Hexafluoride
USEC	United States Enrichment Corporation
VIO	Violation

ACRONYMS USED ON BUILDING X-343 COLD TRAP VALVING SECTION M1.1

Auto/Manual CV	Control valve used to regulate flow of air or process gas into cold traps
ABV	“A” cylinder position bypass valve
AIV	“A” cylinder position inlet valve
AOV	“A” cylinder position outlet valve
ACIV	“A” cylinder position cylinder inlet valve (located on top of the cylinder)
ACOV	“A” cylinder position cylinder outlet valve (located on top of the cylinder)
BBV	“B” cylinder position bypass valve
BIV	“B” cylinder position inlet valve
BOV	“B” cylinder position outlet valve
BCIV	“B” cylinder position cylinder inlet valve (located on top of the cylinder)
BCOV	“B” cylinder position cylinder outlet valve (located on top of the cylinder)
CBV	“C” cylinder position bypass valve
CIV	“C” cylinder position inlet valve
COV	“C” cylinder position outlet valve
CCIV	“C” cylinder position cylinder inlet valve (located on top of the cylinder)
CCOV	“C” cylinder position cylinder outlet valve (located on top of the cylinder)
CTIV	Chemical Trap Inlet Valve
Digital PI	Digital pressure indicator reading out in tenths of a pound PSIA